WHAT IS CLAIMED IS:

1. A waterpouring system for use with a multiple-input, multiple-output (MIMO) transmitter, comprising:

an encoding decision subsystem configured to select a constellation combination based on gains in channels of said MIMO transmitter;

a vector modulator subsystem, coupled to said encoding decision subsystem, configured to modulate a fixed number of bits in a bitstream with said constellation combination to generate a symbol vector; and

a normalization and precoding subsystem, coupled to said vector modulator subsystem, configured to weight said symbol vector based on said gains to yield a weighted symbol vector and distribute said weighted symbol vector among said channels.

2. The waterpouring system as recited in Claim 1 wherein said encoding decision subsystem is configured to select said constellation combination from a set of constellation combinations constituted from at least one modulation technique selected from the group consisting of:

quadrature amplitude modulation, and

phase shift keying.

3. The waterpouring system as recited in Claim 1 wherein said gains are configured to be reflected in an ordered, real diagonal matrix.

4. The waterpouring system as recited in Claim 1 wherein said encoding decision subsystem is configured to select a maximum-rate subchannel constellation and a corresponding gain that encodes a number of bits based on a transmission capacity.

5. The waterpouring system as recited in Claim 1 wherein said weighted symbol vector is configured to have an energy equaling a total transmit energy of said MIMO transmitter.

6. The waterpouring system as recited in Claim 1 wherein said normalization and precoding subsystem is configured to distribute said weighted symbol vector along an orthogonal right singular vector of a matrix representing said channels.

7. The waterpouring system as recited in Claim 1 wherein said MIMO transmitter is configured to form a part of a selected one of:

a narrowband wireless communication system employing multiple antennas,

a broadband communication system employing orthogonal frequency division multiplexing,

a time division multiple access communication system, and

a multiuser communication system.

8. A waterpouring method for a multiple-input, multiple-output (MIMO) transmitter, comprising:

selecting a constellation combination based on gains in channels of said MIMO transmitter;

modulating a fixed number of bits in a bitstream with said constellation combination to generate a symbol vector;

weighting said symbol vector based on said gains to yield a weighted symbol vector, and

distributing said weighted symbol vector among said channels.

9. The method as recited in Claim 8 wherein said selecting comprises selecting said constellation combination from a set of constellation combinations constituted from at least one modulation technique selected from the group consisting of:

quadrature amplitude modulation, and

phase shift keying.

10. The method as recited in Claim 8 wherein said gains are reflected in an ordered, real diagonal matrix.

11. The method as recited in Claim 8 wherein said selecting comprises selecting a maximum-rate subchannel constellation and a corresponding gain that encodes a number of bits based on a transmission capacity.

12. The method as recited in Claim 8 wherein said weighted symbol vector has an energy equaling a total transmit energy of said MIMO transmitter.

13. The method as recited in Claim 8 wherein said distributing comprises distributing said weighted symbol vector along an orthogonal right singular vector of a matrix representing said channels.

14. The method as recited in Claim 8 wherein said MIMO transmitter forms a part of a selected one of:

a narrowband wireless communication system employing multiple antennas,

a broadband communication system employing orthogonal frequency division multiplexing,

a time division multiple access communication system, and

a multiuser communication system.

15. A multiple-input, multiple-output (MIMO) transmitter employing an input bitstream, comprising:

a plurality of transmit channels; and

a waterpouring system, including:

an encoding decision subsystem that selects a constellation combination based on gains in said transmit channels,

a vector modulator subsystem, coupled to said encoding decision subsystem, that modulates a fixed number of bits in said input bitstream with said constellation combination to generate a symbol vector, and

a normalization and precoding subsystem, coupled to said vector modulator subsystem, that weights said symbol vector based on said gains to yield a weighted symbol vector and distributes said weighted symbol vector among said transmit channels.

16. The MIMO transmitter as recited in Claim 15 wherein said encoding decision subsystem selects said constellation combination from a set of constellation combinations constituted from at least one modulation technique selected from the group consisting of:

quadrature amplitude modulation, and

phase shift keying.

17. The MIMO transmitter as recited in Claim 15 wherein said gains are reflected in an ordered, real diagonal matrix.

18. The MIMO transmitter as recited in Claim 15 wherein said encoding decision subsystem selects a maximum-rate subchannel constellation and a corresponding gain that encodes a number of bits based on a transmission capacity.

19. The MIMO transmitter as recited in Claim 15 wherein said weighted symbol vector has an energy equaling a total transmit energy of said MIMO transmitter.

20. The MIMO transmitter as recited in Claim 15 wherein said normalization and precoding subsystem distributes said weighted symbol vector along an orthogonal right singular vector of a matrix representing said transmit channels.